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# Tobacco Use and Secondhand Smoke Exposure During Pregnancy in Two African Countries: Zambia and the Democratic Republic of the Congo

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## Abstract

**Objective—**To study pregnant women's knowledge, attitudes and behaviors towards tobacco use and secondhand smoke (SHS) exposure, and exposure to advertising for and against tobacco products in Zambia and the Democratic Republic of the Congo (DRC).

**Design—**Prospective cross-sectional survey between November 2004 and September 2005.

**Setting—**Antenatal care clinics in Lusaka, Zambia and Kinshasa, DRC.

**Population—**Pregnant women in Zambia (909) and the DRC (847).

**Methods—**Research staff administered a structured questionnaire to pregnant women attending antenatal care clinics.

**Main Outcome Measures—**Pregnant women's use of tobacco, exposure to SHS, knowledge of the harms of tobacco, and exposure to advertising for and against tobacco products.

**Results—**Only about 10% of pregnant women reported having ever tried cigarettes (6.6% Zambia; 14.1% DRC). However, in the DRC, 41.8% of pregnant women had ever tried other forms of tobacco, primarily snuff. About 10% of pregnant women and young children were frequently or always exposed to SHS. Pregnant women's knowledge of the hazards of smoking and SHS exposure was extremely limited. About 13% of pregnant women had seen or heard advertising for tobacco products in the last 30 days.

**Conclusions—**Tobacco use and SHS exposure pose serious threats to the health of women, infants, and children. In many African countries, maternal and infant health outcomes are often poor and will likely worsen if maternal tobacco use increases. Our findings suggest that a

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**Disclosure of Interests**

Dr. Bloch provided depositions on behalf of the U.S. government in the U.S. Department of Justice lawsuit, U.S.A. v. Philip Morris USA, Inc. et al., as part of her official duties. All other authors report no competing interests.

"window of opportunity" exists to prevent increased tobacco use and SHS exposure of pregnant women in Zambia and the DRC.

## Introduction

Tobacco use is widely recognized as one of the leading threats to global health.(1) While tobacco use is stable or decreasing in most high-income countries, it is increasing in many low- and middle-income countries.(2) Currently, the prevalence of smoking by men in developing countries is far higher than that by women; it is estimated that about 50% of men in developing countries smoke cigarettes, compared with only 9% of women.(3) However, there is evidence that the relatively low rates of tobacco use by women in the developing world could rise very quickly.(4–5)

Pregnant women are an important subpopulation to target for tobacco control efforts because both cigarettes and smokeless tobacco products pose serious risks to fetal and newborn health. Cigarette smoking during pregnancy increases the risk of premature rupture of the membranes, placenta previa, placental abruption, preterm delivery and shortened gestation, fetal growth restriction and low birthweight, and sudden infant death syndrome.(6) The use of smokeless tobacco during pregnancy has been associated with stillbirth, preterm birth, and reduced birth weight.(7–9) Maternal tobacco use is also likely to expose infants and young children to secondhand smoke (SHS), a serious health hazard, and to provide role modeling for older children's use of tobacco. Finally, pregnant women who use tobacco may be highly motivated to quit, benefiting their own health and that of their developing child. (10–11)

Sub-Saharan Africa is thought to have one of the world's lowest rates of cigarette consumption, largely attributed to low purchasing power, and low rates of female tobacco use.(12) However, many African countries lack reliable data on tobacco use by women, including pregnant women, which are needed to inform tobacco control and prevention efforts.(13–14) For this reason, we undertook a prospective study of pregnant women's tobacco use, SHS exposure, knowledge and attitudes towards tobacco use, and exposure to advertising for and against tobacco products, in Zambia and the Democratic Republic of the Congo (DRC).

## Materials and Methods

### The Global Network Tobacco Survey

The National Institute of Child Health and Human Development's Global Network for Women's and Children's Health Research focuses on improving maternal and child health outcomes in the developing world; Global Network research units were chosen on the basis of scientific merit and included two in Africa: Zambia and the DRC. Briefly, the Global Network tobacco survey involved 9 research units and included detailed questions about pregnant women's tobacco use (cigarettes and other forms of tobacco), exposure to SHS, attitudes towards tobacco use by women, and exposure to advertising for and against tobacco products.(15) The survey also included both closed- and open-ended questions to determine pregnant women's knowledge of the health hazards of smoking and SHS exposure. The face-to-face survey was administered by trained interviewers to a convenience sample of pregnant women identified at prenatal care clinics, hospitals, or health centers, who were 18 to 46 years of age and beyond the first trimester of pregnancy.

### The Tobacco Survey in Zambia and the DRC

In Zambia, the tobacco survey was conducted at the University Teaching Hospital and ten Urban District midwife-led maternity centers in Lusaka; in the DRC, the tobacco survey was conducted in three maternity hospitals in the central and peripheral area of Kinshasa. Written consent was obtained for all willing, eligible women and ethics approval was obtained from the sponsoring universities and the data coordinating center, Research Triangle Institute. The surveys were administered between November 2004 and September 2005.

### Tobacco Use Status

All pregnant women were asked: “Have you ever tried cigarette smoking, even one or two puffs?” Those responding “yes” were considered to have experimented with cigarettes. Among respondents who had experimented, those who had ever smoked daily and/or had smoked at least 100 cigarettes in their lifetime were considered to have ever been a regular cigarette smoker. Similarly, all pregnant women were asked if they had ever tried, “any other forms of tobacco, besides cigarettes?” Those responding “yes” were considered to have experimented with any other form of tobacco. Among respondents who had experimented, those who had ever used the product daily and/or had used the product at least 100 times were considered to have ever been a regular user of that product.

### SHS exposure

All pregnant women were asked: “Is smoking of tobacco products allowed in your home?” “How often are you indoors and around people who are smoking cigarettes or other types of tobacco products?” and “How often are your children, 5 years or younger, indoors and around people who are smoking cigarettes or other types of tobacco products?”

### Exposure to Advertising For and Against Tobacco Products

Pregnant women were asked if they had seen or heard advertising for tobacco products in the last 30 days. Those responding “yes” were asked about the frequency and location of exposure. Similarly, pregnant women were asked if they had seen or heard advertising against tobacco products in the last 30 days; those responding “yes” were asked about the frequency and location of exposure.

### Socioeconomic Status (SES)

For Zambia, SES status was computed using the household asset index established by the World Bank.(16) For the DRC, the household asset index for Cameroon was used, because an index for the DRC was unavailable.(17)

### Data Analysis

Data analysis was performed using SAS version 9.1.3. We calculated descriptive statistics (frequencies, percentages, means and standard deviations) for each site, excluding missing data from the analysis. For each country, odds ratios and 95% confidence intervals were computed to assess the differences between literate and non-literate pregnant women for specific tobacco variables.

## Results

### Sample Demographics

A total of 1915 women were screened and of these, 1769 (92%) were eligible and 1756 (99%) provided consent and completed the survey, 909 in Zambia and 847 in the DRC. The

mean age of the pregnant women surveyed was 26.1 years (25.0 years in Zambia, 27.3 years in the DRC; Table 1). Most respondents lived in an urban setting (94.8% in Zambia, 61.8% in the DRC). A majority of respondents had completed 6 – 10 years of formal education (61.3% in Zambia, 52.7% in the DRC), and were literate (75.0% in Zambia, 90.8% in the DRC). In both countries, more than 85% of respondents were either married or were a member of a couple, and most were from the two highest SES status quintiles.

### Tobacco Use, SHS Exposure, and Attitudes Towards Women's Tobacco Use

Respondents from the DRC were more than twice as likely as those from Zambia to report having ever tried cigarette smoking (14.1% in DRC, 6.6% in Zambia; Table 2). In both countries however, less than 1% of pregnant women had ever been a regular cigarette smoker, and very few thought it was acceptable for women in their community to smoke cigarettes.

Few respondents from Zambia had ever tried any other (non-cigarette) tobacco product (2.2%). In contrast, in the DRC, more than four in ten respondents (41.8%) reported having ever tried any other tobacco product, usually snuff, and nearly half (49.7%) of those who had never tried thought they would do so in the next year (data not shown). Few respondents in either country thought it was acceptable for women in their community to use other (non-cigarette) tobacco products.

In both countries, respondents were most likely to report that they and their young children (<5 years old) were rarely or never exposed to tobacco smoke indoors. However, about one in five pregnant women reported that tobacco smoking was permitted in their home (20.5% in Zambia; 17.1% in the DRC), and a minority reported that they were frequently or always exposed to tobacco smoke indoors (13.6% in Zambia, 8.3% in the DRC) and that their children were frequently or always exposed to tobacco smoke indoors (13.1% in Zambia, 6.4% in the DRC). About one in four respondents lived in a household where one or more other people used tobacco products.

### Exposure to Advertising For and Against Tobacco Products

In Zambia, 14.0% of pregnant women reported having seen or heard advertising for tobacco products, while 21.1% reported having seen or heard advertising against tobacco products in the last 30 days. The frequency of exposure to both types of advertising was typically very low (1 or more times a month). The most commonly cited channels of exposure to both pro- and anti-tobacco advertising were television, radio, magazines, and community or other events (data not shown).

In the DRC, 11.9% of pregnant women reported having seen or heard advertising for tobacco products, while 19.5% reported having seen or heard advertising again tobacco products in the last 30 days. However, daily or weekly exposure was reported by 73% of those exposed to pro-tobacco advertising, compared with only 40.2% of those exposed to anti-tobacco advertising. Commonly cited channels for pro-tobacco advertising were television and billboards; commonly cited channels for anti-tobacco advertising were television, church and transport (data not shown).

### Knowledge of the Health Hazards of Cigarette Smoking and SHS Exposure

In both countries, nearly all pregnant women responded affirmatively when asked if "a woman who smokes cigarettes harms her own health, or not?" However, when asked to name health effects or diseases caused by cigarette smoking, it was apparent that respondents' knowledge was very limited. In Zambia, cough was the most frequent response (54.6%), followed by lung disease (44.8%), lung cancer (17.8%), asthma (12.3%), and heart

disease (11.9%). In the DRC, respondents most frequently mentioned lung disease (23.5%), followed by cough (21.6%), and lung cancer (12.7%).

In both countries, most pregnant women (>82%) responded affirmatively when asked if a mother smokes cigarettes during pregnancy, "her smoking can harm her unborn baby's health, or not?" However, more than one-third of pregnant women in both countries responded "don't know" when asked to name a specific health effect or disease caused by smoking during pregnancy. The next most common response in both countries was respiratory/breathing problem (33.3% in Zambia, 26.0% in the DRC). Lower birthweight was mentioned by 10.8% of pregnant women in Zambia and 5.2% of pregnant women in the DRC.

In both countries, more than 80% of pregnant women responded affirmatively when asked "do you think the smoke from other people's cigarettes is harmful, or not?" When asked to name a specific health effect or disease caused by exposure to other people's cigarette smoking, the most common response in both countries was respiratory/breathing problem (56.3% in Zambia, 33.8% in the DRC). In Zambia, 10.5% of respondents mentioned lung cancer, and 8.7% mentioned heart disease. In the DRC, other responses were very uncommon.

### Relationship Between Literacy and Tobacco Exposure

In both Zambia and the DRC, literate pregnant women were significantly less likely to live with other tobacco users, to live in a home where tobacco smoking was permitted, and to report they or their young children were frequently or always exposed to tobacco smoke indoors, compared to other women (Table 3). However, literacy was not significantly associated with whether or not pregnant women had ever tried a tobacco product, with the perceived acceptability of women's tobacco use, or with women's exposure to pro-tobacco advertising. In the DRC, literate pregnant women were more likely than illiterate women to report exposure to anti-tobacco advertising.

## Discussion

To our knowledge, this is the first study to examine pregnant women's knowledge, attitudes, and behaviors regarding tobacco use and SHS exposure in the DRC or Zambia. In both countries, a small number of pregnant women had ever tried cigarettes (<15%) and very few had ever been a regular smoker (<1%). However, about four in ten DRC respondents had tried snuff, and many others said they intended to do so in the future. About 10% of pregnant women and young children were frequently or always exposed to SHS and this level of exposure was significantly more common among illiterate pregnant women and their young children. In both countries, pregnant women's knowledge of the health hazards of cigarette smoking was extremely limited, and more than 10% of respondents had been exposed to tobacco advertising in the last 30 days.

Our results are consistent with the available data suggesting that female cigarette smoking is currently quite low in most countries of sub-Saharan Africa.(18–19) However, the Global Youth Tobacco Survey (GYTS), a school based survey of students aged 13–15, has determined that in many regions of the world, including Africa, the difference between boys' and girls' cigarette smoking is far narrower than that between adult men and women.(20) The 2002 Zambia GYTS found only modest differences between boys' and girls' cigarette smoking (boys: 10.8% – 14.9%, girls: 8.2% – 12.4%) and use of other tobacco products (boys: 16.4% – 20.0%, girls: 16.3% – 22.9%).(21) This suggests that Zambia, like some other African countries, may be poised for far higher tobacco use rates among women. The GYTS has not been conducted in the DRC.

The use of pipes, snuff, and rolled tobacco leaves is believed to be widespread in sub-Saharan Africa.(22) The use of smokeless tobacco, which encompasses a very diverse group of products, has been studied in South Africa, Tanzania, and Sudan.(23–26) In addition to the potential hazards of use during pregnancy, smokeless tobacco products contain nicotine, numerous carcinogens and other toxicants, and cause cancers of the oral cavity, esophagus, and pancreas.(27) Preliminary evidence suggests that in the DRC, many pregnant women view snuff and chewing tobacco as forms of medicine and use these products to treat flu, colds and other common ailments, for their pharmacological effects, or instead of alcohol. A better understanding of pregnant women's misperceptions about these forms of tobacco is urgently needed.

Exposure to SHS poses a serious health hazard for adults and children.(28–29) Maternal exposure to SHS during pregnancy is causally related to a small reduction in infant birthweight, and postnatal exposure to SHS is causally related to sudden infant death syndrome. Additionally, suggestive evidence indicates a relationship between maternal exposure to SHS during pregnancy and preterm delivery. In children, SHS exposure increases the risk for acute lower respiratory infections, middle ear diseases, and asthma. In adults, SHS exposure causes coronary heart disease and lung cancer. Particularly in countries where few women smoke, such as Zambia and the DRC, research is needed to define culturally acceptable ways for women to create smoke-free home environments for themselves and their children. Effective strategies to prevent and control tobacco use by men, including policy measures and family- and community-based approaches, will significantly benefit the health of women and children as well.

Although overall knowledge was low, pregnant women in Zambia were somewhat more knowledgeable about the hazards of active smoking and SHS exposure than their counterparts in the DRC, despite higher literacy rates in the DRC. This may be attributed to the more urban setting of the Zambia study, differences in the availability of health information, or other factors. In both countries, pregnant women's limited knowledge of the health hazards of smoking and SHS exposure is a serious challenge to tobacco control and prevention efforts. Health warning messages on tobacco packages, now required in many countries, are a cost-effective way to increase public knowledge.(30) Large, picture-based warnings have greater effectiveness than small, text-only messages, and may be especially useful in reaching young people, those with little education and low levels of literacy, and in countries where multiple languages are spoken.(31–33) This strategy should have particular appeal in low- and middle-income countries because, unlike most educational interventions, the financial cost of health warning messages is borne entirely by tobacco manufacturers. While most African countries require tobacco health warning messages, currently only one country (Mauritius) requires picture-based warnings.

Tobacco advertising is an important factor promoting tobacco use.(34–37) In both countries, some pregnant women reported exposure to tobacco advertising (Zambia: 14%, DRC: 11.9%). The Framework Convention on Tobacco Control (FCTC), the first treaty ever negotiated under the auspices of the World Health Organization, requires parties to the treaty put in place a comprehensive ban on all tobacco advertising, promotion, and sponsorship, consistent with national law.(38) Zambia, but not the DRC, is a party to the FCTC. At present, Zambia does not ban any form of tobacco advertising, while the DRC employs a partial ban; however partial advertising bans have not been found to be effective, because they allow advertising to be shifted from venues that are banned to those that are not.(39)

In many African countries, including Zambia and the DRC, maternal and child health outcomes are often poor.(40) The World Health Organization's African region has the

highest neonatal mortality rate in the world (43 per 1000 live births) and accounts for 43% of global deaths in children under age 5. Additionally, 19 of the 20 countries with the highest maternal mortality ratios are in the African region. African women bear the burden of nearly half of all global maternal deaths as a result of pregnancy and childbirth; overall maternal mortality is 910 per 100,000 live births. The WHO African Regional Health Report notes that efforts to improve maternal and child health outcomes are hampered by poverty, illiteracy, weak health systems, a shortage of skilled health workers, armed conflict and humanitarian emergencies, the HIV/AIDS epidemic, and other factors.

The current relatively low rates of tobacco use by women and men are one of the few positive health indicators in the African region. However, there is already evidence that this is changing. Many developing countries are undergoing a “risk transition,” wherein traditional risk factors for poor health associated with poverty have been joined by risk factors of affluence, because of marked changes in global patterns of consumption, particularly of food, alcohol, and tobacco.(41) Africa has not been exempt from this risk transition; increasingly, addressing non-communicable disease risk factors, such as tobacco use, is recognized as central to improving the health, social, and economic development of African countries.(42–43)

Our study has several limitations. In both countries, we surveyed a convenience sample of pregnant women seeking care at maternity clinics. Each country’s sample is not nationally representative, and is also not population-based; as demonstrated by the paucity of respondents in the lower SES quintiles, the most disadvantaged women were under-represented. Because the survey relied on self-report in cultures with strong social pressure against women’s tobacco use, the findings may underestimate the scope of the problem. Finally, studies of pregnant women’s tobacco use and SHS exposure should be conducted in other countries in sub-Saharan Africa, to provide a better understanding of the regional problem.

Averting a rise in tobacco use by women in developing countries has long been regarded as a key public health priority.(44) In settings where pregnancy outcomes are already often poor, such as in Zambia, the DRC, and many other African countries, a rise in pregnant women’s tobacco use and SHS exposure has the potential to dramatically worsen health outcomes. Our findings suggest that there remains a critical “window of opportunity” to prevent an increase in tobacco use and SHS exposure among pregnant women in both Zambia and the DRC. However, pregnant women’s limited knowledge of the health hazards of smoking, and the exposure of some to tobacco advertising, are troubling signs. We suggest that implementing evidence-based strategies to prevent and control tobacco use will be crucial to promoting and protecting maternal and child health in these two African countries.

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## Table 1

Participant Demographics

| Variable | Zambia n = 909 | DRC n = 847 | Total n = 1,756 |
|---|---|---|---|
| **Age**, mean (SD) | 25.0 (5.5) | 27.3 (6.1) | 26.1 (5.9) |
| **Municipality type** | 908 | 844 | 1,752 |
| Urban, n (%) | 861 (94.8) | 522 (61.8) | 1,383 (78.9) |
| Semi-urban, n (%) | 21 (2.3) | 322 (38.2) | 343 (19.6) |
| Rural, n (%) | 26 (2.9) | 0 (0.0) | 26 (1.5) |
| **Education** | 908 | 846 | 1,754 |
| No education, n (%) | 41 (4.5) | 18 (2.1) | 59 (3.4) |
| 1 – 5 years, n (%) | 137 (15.1) | 92 (10.9) | 229 (13.1) |
| 6 – 10 years, n (%) | 557 (61.3) | 446 (52.7) | 1,003 (57.2) |
| >10 years, n (%) | 173 (19.1) | 290 (34.3) | 463 (26.4) |
| **Literate**, n (%) | 681 (75.0) | 769 (90.8) | 1,450 (82.6) |
| **Marital status** | 909 | 847 | 1,756 |
| Married/Member of unmarried couple, n (%) | 829 (91.2) | 725 (85.6) | 1,554 (88.5) |
| Other, n (%) | 80 (8.8) | 122 (14.4) | 202 (11.5) |
| **SES Index** | 903 | 841 | 1,744 |
| Quintile 1, n (%) | 2 (0.2) | 0 (0.0) | 2 (0.1) |
| Quintile 2, n (%) | 9 (1.0) | 0 (0.0) | 9 (0.5) |
| Quintile 3, n (%) | 19 (2.1) | 22 (2.6) | 41 (2.4) |
| Quintile 4, n (%) | 506 (56.0) | 273 (32.5) | 779 (44.7) |
| Quintile 5, n (%) | 367 (40.6) | 546 (64.9) | 913 (52.4) |

## Table 2

Pregnant Women's Tobacco Use, Secondhand Smoke Exposure, Advertising Exposure, Knowledge and Attitudes

| Variable | Zambia n = 909 n (%) | DRC n = 847 n (%) | Total n = 1,756 n (%) |
|---|---|---|---|
| **Cigarette use** | | | |
| Ever tried cigarette smoking | 60 (6.6) | 119 (14.1) | 179 (10.2) |
| Ever a regular cigarette smoker | 3 (0.3) | 5 (0.6) | 8 (0.5) |
| Think acceptable for women to smoke cigarettes | 17 (1.9) | 17 (2.0) | 34 (1.9%) |
| **Other tobacco product use** | | | |
| Ever tried other tobacco product | 20 (2.2) | 352 (41.8) | 372 (21.2) |
| Ever a regular user of other tobacco product | 0 (0.0) | 3 (0.4) | 3 (0.2) |
| Think acceptable for women to use other tobacco products | 13 (1.4) | 32 (3.8) | 45 (2.6) |
| **SHS exposure** | | | |
| Live with one or more tobacco users | 213 (23.4) | 229 (27.0) | 442 (25.2) |
| Smoking of tobacco products permitted in the home | 186 (20.5) | 144 (17.1) | 330 (18.9) |
| Woman's exposure to tobacco smoke indoors (n) | **908** | **842** | **1,750** |
| Rarely or Never | 596 (65.6) | 562 (66.7) | 1,158 (66.2) |
| Sometimes | 188 (20.7) | 210 (24.9) | 398 (22.7) |
| Frequently or Always | 124 (13.6) | 70 (8.3) | 194 (11.1) |
| Young children's exposure to tobacco smoke indoors (n)† | **490** | **541** | **1,031** |
| Rarely or Never | 349 (71.2) | 402 (74.3) | 751 (72.8) |
| Sometimes | 77 (15.7) | 104 (19.2) | 181 (17.6) |
| Frequently or Always | 64 (13.1) | 35 (6.4) | 99 (9.6) |
| **Tobacco Advertising Exposure** | | | |
| Seen/heard advertising **for** tobacco products | 127 (14.0) | 100 (11.9) | 227 (13.0) |
| Seen/heard 1 or more times a day | 4 (3.1) | 39 (39.0) | 43 (18.9) |
| Seen/heard 1 or more times a week | 33 (26.0) | 34 (34.0) | 67 (29.5) |
| Seen/heard 1 or more times a month | 90 (70.9) | 27 (27.0) | 117 (51.5) |
| Seen/heard advertising **against** tobacco products | 192 (21.1) | 164 (19.5) | 356 (20.3) |
| Seen/heard 1 or more times a day | 6 (3.1) | 41 (25.0) | 47 (13.2) |
| Seen/heard 1 or more times a week | 39 (20.3) | 25 (15.2) | 64 (18.0) |
| Seen/heard 1 or more times a month | 147 (76.6) | 98 (59.8) | 245 (68.8) |
| **Think cigarette smoking harms woman's health** | 879 (96.7) | 821 (97.5) | 1,700 (97.1) |
| Specific disease/condition can name:* | | | |
| Asthma | 112 (12.3) | 9 (1.1) | 121 (6.9) |
| Bronchitis | 55 (6.1) | 11 (1.3) | 66 (3.8) |
| Lung disease | 407 (44.8) | 198 (23.5) | 605 (34.6) |
| Cough | 496 (54.6) | 182 (21.6) | 678 (38.7) |

| Variable | Zambia n = 909 n (%) | DRC n = 847 n (%) | Total n = 1,756 n (%) |
|---|---|---|---|
| Lung cancer | 162 (17.8) | 107 (12.7) | 269 (15.4) |
| Cancer, other | 80 (8.8) | 15 (1.8) | 95 (5.4) |
| Heart disease | 108 (11.9) | 38 (4.5) | 146 (8.3) |
| Don't know | 42 (4.6) | 40 (4.8) | 82 (4.7) |
| **Think cigarette smoking during pregnancy harms baby** | 751 (82.7) | 768 (91.2) | 1,519 (86.8) |
| Specific disease/condition can name:* | | | |
| Lower birth weight | 98 (10.8) | 44 (5.2) | 142 (8.1) |
| Preterm delivery | 62 (6.8) | 5 (0.6) | 67 (3.8) |
| Infant death | 58 (6.4) | 32 (3.8) | 90 (5.1) |
| Respiratory/Breathing problem | 303 (33.3) | 219 (26.0) | 522 (29.8) |
| Crib death/SIDS | 37 (4.1) | 3 (0.4) | 40 (2.3) |
| Don't know | 321 (35.3) | 321 (38.1) | 642 (36.7) |
| **Think SHS is harmful** | 754 (82.9) | 704 (83.6) | 1,458 (83.3) |
| Specific disease/condition can name:* | | | |
| Lung cancer | 95 (10.5) | 32 (3.8) | 127 (7.3) |
| Heart disease | 79 (8.7) | 27 (3.2) | 106 (6.1) |
| Disease in Children | 19 (2.1) | 4 (0.5) | 23 (1.3) |
| Respiratory/Breathing problem | 509 (56.3) | 284 (33.8) | 793 (45.5) |
| Don't know | 168 (18.6) | 269 (32.0) | 437 (25.1) |

† - Results exclude respondents without children 5 years or younger.

* May be greater than 100% because respondents were permitted to name more than one disease/condition.

**Table 3**

Relationship of Literacy to Tobacco Variables for Pregnant Women in Zambia and DRC

| | Zambia | | | | DRC | | | |
|---|---|---|---|---|---|---|---|---|
| | Literate | | Odd Ratio (95% CI) | P-value | Literate | | Odd Ratio (95% CI) | P-value |
| | Yes N=681 % | No N=227 % | | | Yes N=769 % | No N=78 % | | |
| **Tobacco Use and SHS Exposure** | | | | | | | | |
| Ever tried cigarette or other form of tobacco | 6.5 | 7.0 | 0.91 (0.50, 1.65) | 0.7617 | 14.5 | 10.4 | 1.46 (0.68, 3.12) | 0.3245 |
| Live with one or more tobacco users | 19.8 | 34.4 | 0.47 (0.34, 0.66) | <.0001 | 25.7 | 39.7 | 0.53 (0.32, 0.85) | 0.0080 |
| Tobacco smoking permitted in the home | 17.5 | 29.5 | 0.51 (0.36, 0.72) | 0.0001 | 16.2 | 26.0 | 0.55 (0.32, 0.95) | 0.0301 |
| Women frequently or always exposed to tobacco smoke indoors | 11.8 | 19.4 | 0.55 (0.37, 0.83) | 0.0038 | 7.1 | 20.8 | 0.29 (0.16, 0.54) | <.0001 |
| Young children frequently or always exposed to tobacco smoke indoors | 10.9 | 19.1 | 0.52 (0.30, 0.90) | 0.0174 | 5.6 | 12.7 | 0.41 (0.18, 0.95) | 0.0325 |
| **Attitudes** | | | | | | | | |
| Think acceptable for women to smoke cigarettes | 1.5 | 3.1 | 0.47 (0.18, 1.25) | 0.1200 | 2.1 | 1.3 | 1.62 (0.21, 12.41) | 0.6373 |
| Think acceptable for women to use other tobacco products | 1.0 | 2.6 | 0.38 (0.13, 1.15) | 0.0760 | 3.8 | 3.9 | 0.97 (0.29, 3.27) | 0.9633 |
| **Marketing Exposure** | | | | | | | | |
| Seen/heard pro-tobacco advertising | 14.4 | 12.8 | 1.15 (0.74, 1.79) | 0.5434 | 12.5 | 5.2 | 2.62 (0.94, 7.33) | 0.0573 |
| Seen/heard anti-tobacco advertising | 21.8 | 19.4 | 1.16 (0.79, 1.69) | 0.4469 | 20.5 | 9.1 | 2.58 (1.16, 5.73) | 0.0158 |